Memorandum
Perimeter Berm Construction
Steve Trettel, P.E

MEMORANDUM

DATE: April 24, 2007
TO: Mike Quatromoni
FROM: Steve Trettel, P.E.
SUBJECT: Crow Lane Landfill, Newburyport, MA
Perimeter Berm Foundation Stability

The most factual and convincing evidence that peat was removed from within the foot print of the berm before berm fill was placed is the factual stability of the berm as constructed. Because the original landfill was pushed out over the existing swamp when it was constructed in the 60's and 70's swamp deposits (peat and organic silt) was located below and outside of the existing Toe of Slope. These deposits were found to vary from 2' to 4' thick. The physical characteristics of these deposits is high compressibility and very low shear strength (Figure 1).

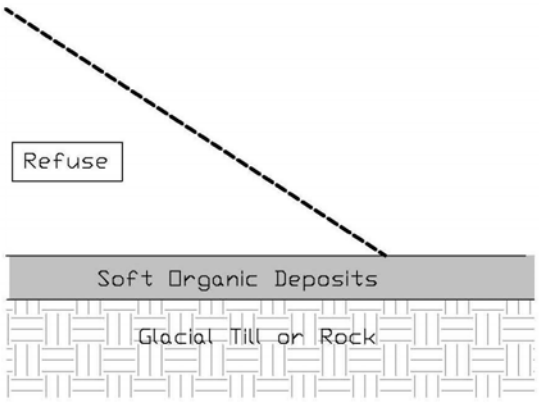

Figure 1

Pre Construction Condition at Toe of Landfill

New Ventures in initial construction work was to prepare the foundation for the perimeter berm as shown on Figure 2:

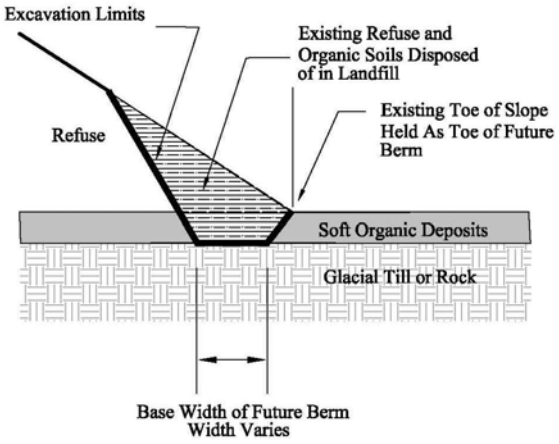

Figure 2
Berm Foundation Preparation

Berms were then constructed of clean granular fill to various heights in accordance with proposed final grades or interim levels of refuse fill. The most extreme current conditions with respect to loading of the existing berm is on the west side.

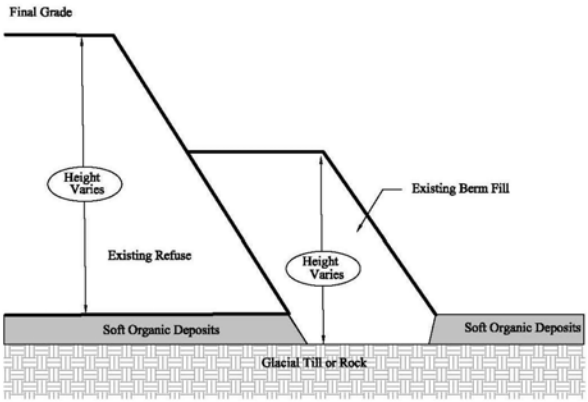

Figure 3

Current Geometery

It is self evident that had the highly compressible, low strength organic deposits been left in place under the berm fill one of the situations illustrated in Figure 4 would have already occurred:

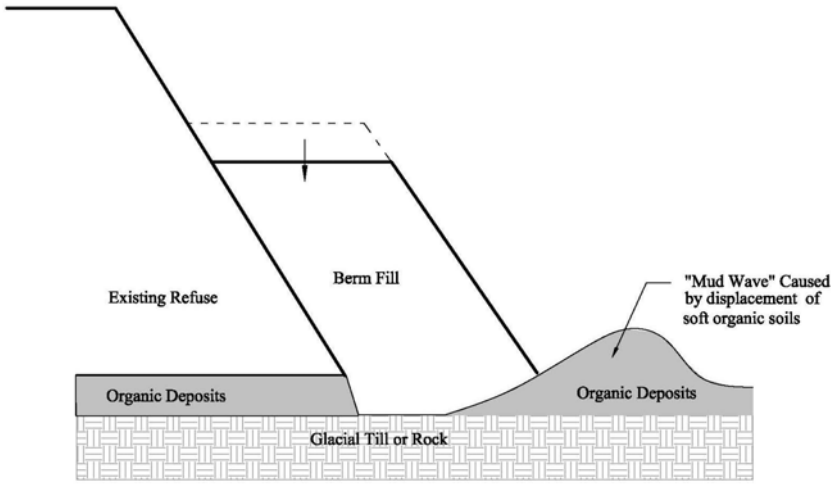

Figure 4A
Mud Wave

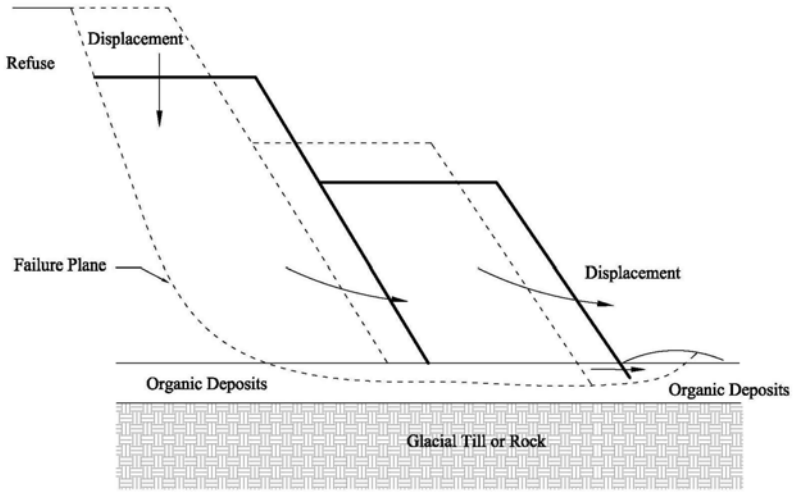

Figure 4B
Sliding Failure and Displacement

Any slope stability analysis performed with the assumption that the organic deposits characterized by very low shear strength (negligible) and very high compressibility would result in a factor of safety well below zero.

The obvious conclusion is that the existing berm on the west and part of the north side would have failed during construction let alone remained intact and stable at its current height and the height of refuse behind it unless the soft organic deposits had been totally removed as previously stated.